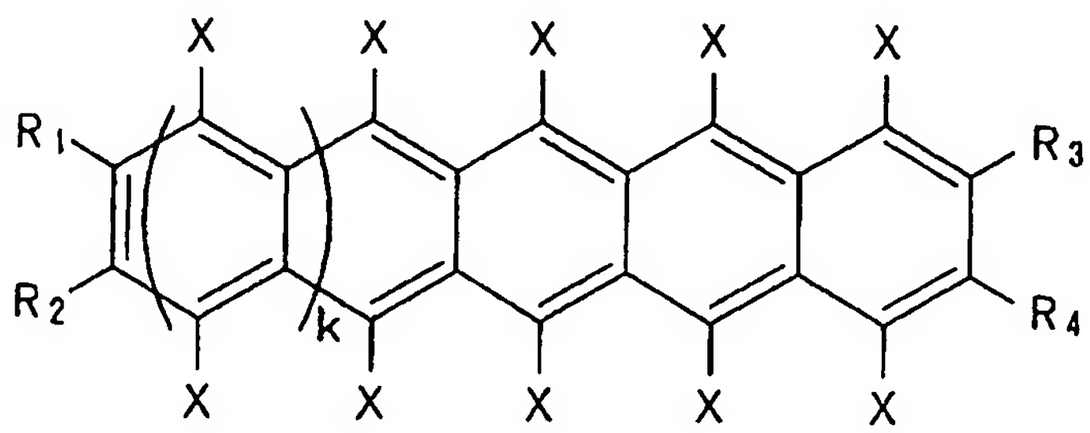
AMENDMENTS TO THE CLAIMS

1. (Previously presented) A polyacene compound having a structure represented by the chemical formula (I):



(I)

wherein at least one of R_1, R_2, R_3 and R_4 in the chemical formula (I) is/are an aliphatic hydrocarbon group (such as an alkyl group, alkenyl group or alkynyl group), aryl group, alkoxy group, aryloxy group, acyl group, ester group, alkyloxycarbonyl group, aryloxycarbonyl group, carboxyl group, formyl group, hydroxyl group, halogen group, amino group, imino group, amide group, cyano group, silyl group, mercapto group, sulfide group, disulfide group or sulfonyl group, or a functional group containing 2 or more groups thereof, and the other(s) is/are a hydrogen atom, some of Xs, that are two or more, are a halogen group and the other(s) is/are a hydrogen atom, and k is an integer of 1 to 5.

2. (Original) The polyacene compound according to claim 1, wherein R_3 and R_4 are each a hydrogen atom.

3. (Original) The polyacene compound according to claim 1, wherein at least one of the combinations (R_1 and R_2) and (R_3 and R_4) forms a cyclic structure, after R_1 and R_2 or R_3 and R_4 are bound to each other.

4. (Currently amended) The polyacene compound according to ~~any one of claims 1 to 3~~ claim 1, wherein R_1, R_2, R_3 and R_4 have 1 to 15 carbon atoms, when they are functional groups.

5. (Currently amended) The polyacene compound according to ~~any one of claims 1 to 3~~ claim 1, wherein R_1, R_2, R_3 and R_4 have 2 to 15 carbon atoms, when they are functional groups.

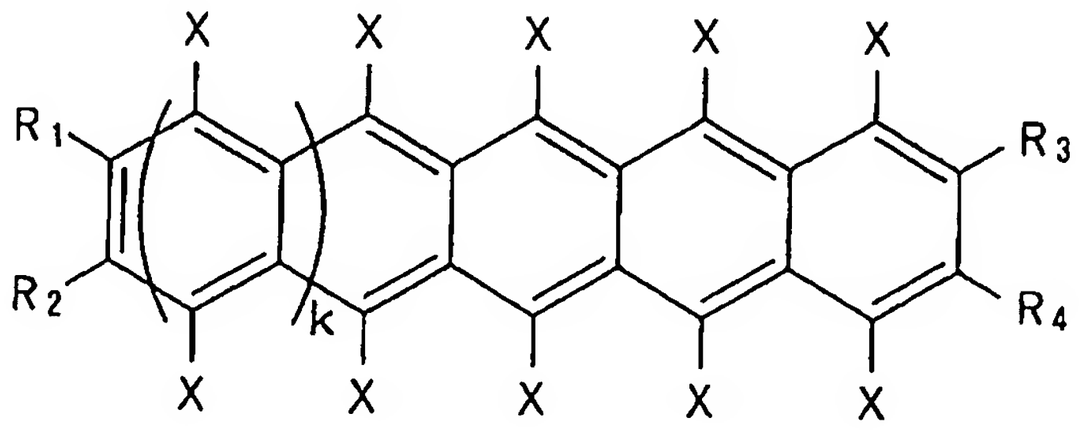
6. (Currently amended) The polyacene compound according to ~~any one of claims 1 to 3~~ claim 1, wherein R_1, R_2, R_3 and R_4 have 2 to 6 carbon atoms, when they are functional groups.

7. (Currently amended) The polyacene compound according to ~~any one of claims 1 to 3~~ claim 1, wherein an even number of Xs are each a halogen group, at least 2 of which are bound to the same acene ring.

8. (Currently amended) The polyacene compound according to ~~any one of claims 1 to 3~~ claim 1, wherein two of Xs are each a halogen group and bound to the same acene ring.

9. (Currently amended) The polyacene compound according to ~~any one of claims 1 to 3~~ claim 1, wherein k is 1 or 2.

10. (Previously presented) An organic semiconductor thin film made of a polyacene compound having a structure represented by the chemical formula (I) and having crystallinity.



(I)

wherein at least one of R_1, R_2, R_3 and R_4 is/are an aliphatic hydrocarbon group (such as an alkyl group, alkenyl group or alkynyl group), aryl group, alkoxy group, aryloxy group, acyl group, ester group, alkyloxycarbonyl group, aryloxycarbonyl group, carboxyl group, formyl group, hydroxyl group, halogen group, amino group, imino group, amide group, cyano group, silyl group, mercapto group, sulfide group, disulfide group or sulfonyl group, or a functional group containing 2 or more thereof, and the other(s) is/are a hydrogen atom; some of Xs is/are a halogen group and the other(s) is/are a hydrogen atom; and k is an integer of 1 to 5.

11. (Previously presented) The organic semiconductor thin film according to claim 10, wherein R_3 and R_4 are each a hydrogen atom.

12. (Previously presented) The organic semiconductor thin film according to claim 10, wherein at least one of the combinations (R_1 and R_2) and (R_3 and R_4) forms a cyclic structure, after R_1 and R_2 or R_3 and R_4 are bound to each other.

13. (Currently amended) The organic semiconductor thin film according to ~~any one of claims 10 to 12~~ claim 10, wherein R_1, R_2, R_3 and R_4 have 1 to 15 carbon atoms, when they are functional groups.

14. (Currently amended) The organic semiconductor thin film according to ~~any one of claims 10 to 12~~ claim 10, wherein R_1, R_2, R_3 and R_4 have 2 to 15 carbon atoms, when they are functional groups.

15. (Currently amended) The organic semiconductor thin film according to ~~any one of claims 10 to 12~~ claim 10, wherein R_1, R_2, R_3 and R_4 have 2 to 6 carbon atoms, when they are functional groups.

16. (Currently amended) The organic semiconductor thin film according to ~~any one of claims 10 to 12~~ claim 10, wherein an even number of Xs are each a halogen group, at least two of which are bound to the same acene ring.

17. (Currently amended) The organic semiconductor thin film according to ~~any one of claims 10 to 12~~ claim 10, wherein two of Xs are each a halogen group and bound to the same acene ring.

18. (Currently amended) The organic semiconductor thin film according to ~~any one of claims 10 to 12~~ claim 10, wherein k is 1 or 2.

19. (Currently amended) The crystalline organic semiconductor thin film according to ~~any one of claims 10 to 18~~ claim 10 formed on a substrate, wherein the major axis of the molecule of the polyacene compound is oriented toward a right angle to the substrate surface.

20. (Currently amended) An organic semiconductor device composed of the organic semiconductor thin film according to ~~any one of claims 10 to 19~~ claim 10, at least partly.

21. (Currently amended) A transistor comprising a gate electrode, dielectric layer, source electrode, drain electrode and semiconductor layer, wherein the semiconductor layer is composed of the organic semiconductor thin film according to ~~any one of claims 10 to 19~~ claim 10.

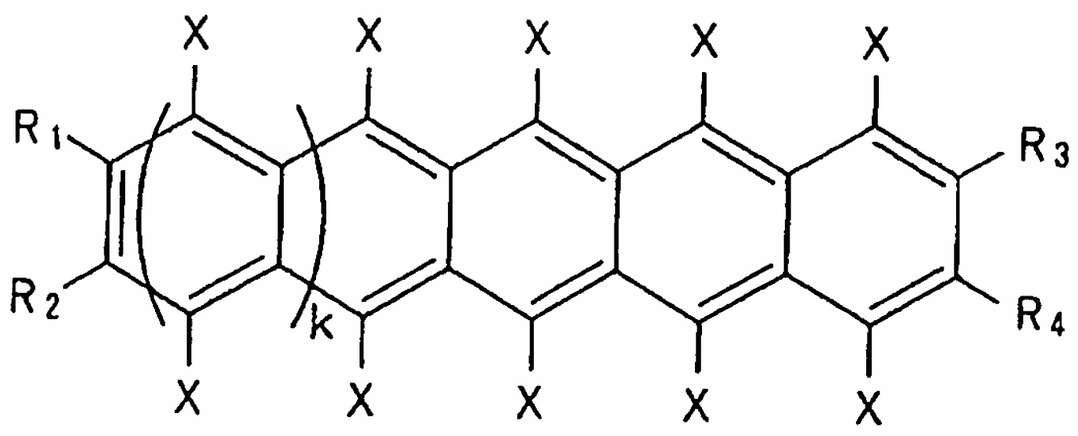
22. (Previously presented) A method for producing a polyacene compound from a polyacenequinone derivative by two reaction steps comprising:

a first reaction step of reducing a polyacenequinone derivative into a hydroxypolyacene derivative, and a second reaction step of halogenating and aromatizing the hydroxypolyacene

derivative into a polyacene compound having a structure represented by the chemical formula (I), wherein

the polyacenequinone derivative has a chemical structure corresponding to that of the polyacene compound, has the same number of 6-membered rings and the same R_1, R_2, R_3 and R_4, and has the carbonyl carbon of quinine, the carbon atom of which will be bound to a halogen group, when it is converted into the polyacene compound, and

the hydroxypolyacene derivative has a chemical structure corresponding to that of the polyacene compound, has the same number of 6-membered rings and the same R_1, R_2, R_3 and R_4, and has a carbon atom bound to a hydroxyl group and hydrogen atom, which will be bound to a halogen group, when it is converted into the polyacene compound.

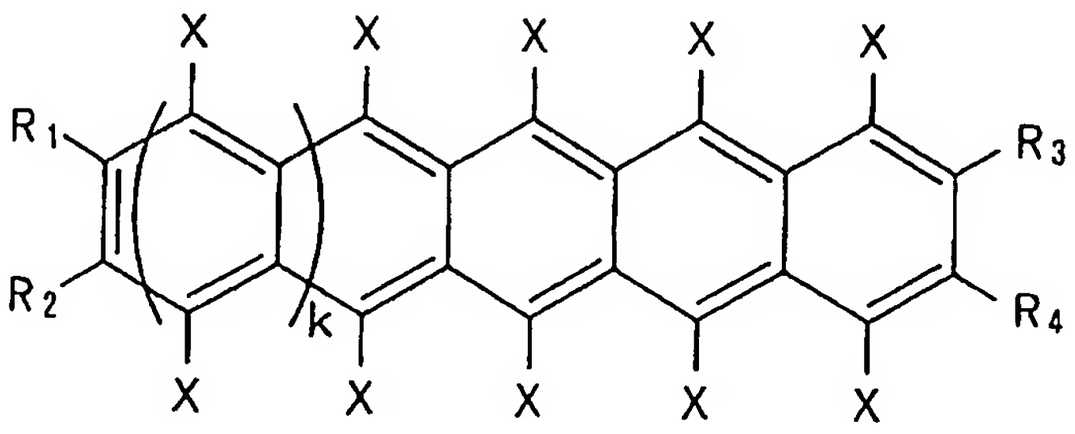


(I)

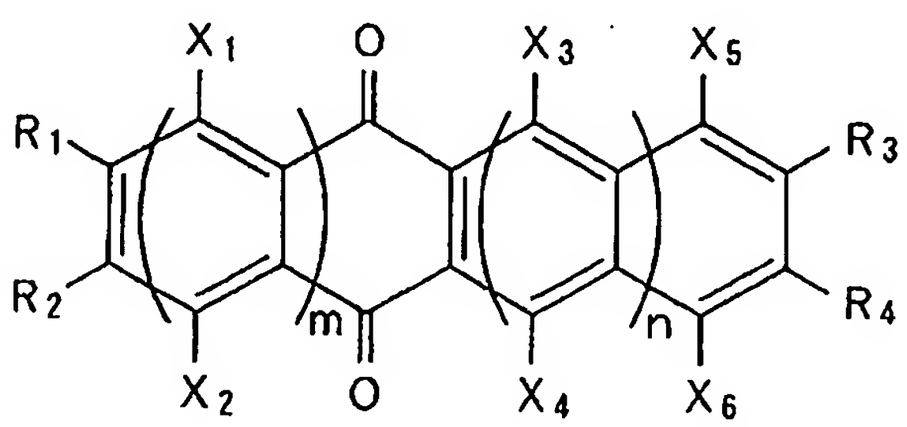
wherein at least one of R_1, R_2, R_3 and R_4 in the chemical formula (I) is/are an aliphatic hydrocarbon group (such as an alkyl group, alkenyl group or alkynyl group), aryl group, alkoxy group, aryloxy group, acyl group, ester group, alkyloxycarbonyl group, aryloxycarbonyl group, carboxyl group, formyl group, hydroxyl group, halogen group, amino group, imino group, amide group, cyano group, silyl group, mercapto group, sulfide group, disulfide group or sulfonyl group, or a functional group containing 2 or more thereof, and the other(s) is/are a hydrogen

atom; some of Xs in the chemical formula (I) is/are a halogen group and the other(s) is/are a hydrogen atom; and k is an integer of 1 to 5.

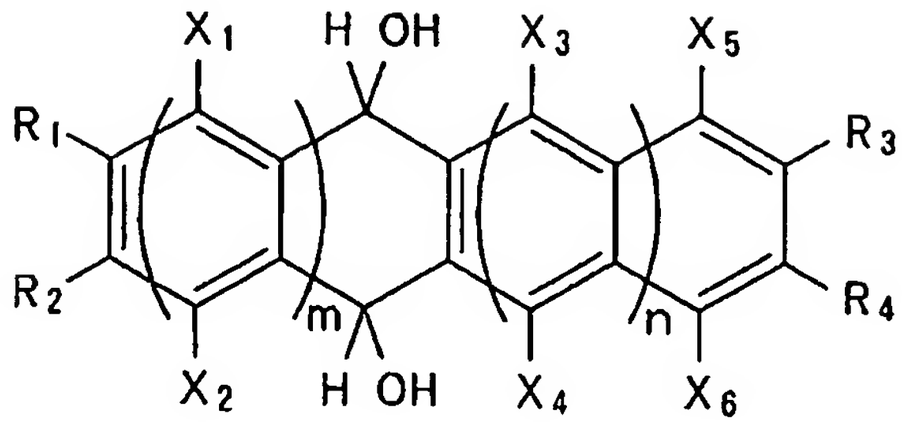
23. (Previously presented) A method for producing a polyacene compound having a structure represented by the following chemical formula (I) by two reaction steps, comprising a first reaction step of reducing a polyacenequinone derivative having a structure represented by the chemical formula (II) into a hydroxypolyacene derivative having a structure represented by the chemical formula (III), and a second reaction step of halogenating and aromatizing the hydroxypolyacene derivative,



(I)



(II)



(III)

wherein at least one of R_1, R_2, R_3 and R_4 in the chemical formulas (I), (II) and (III) is/are an aliphatic hydrocarbon group (such as an alkyl group, alkenyl group or alkynyl group), aryl group, alkoxy group, aryloxy group, acyl group, ester group, alkyloxycarbonyl group, aryloxycarbonyl group, carboxyl group, formyl group, hydroxyl group, halogen group, amino group, imino group, amide group, cyano group, silyl group, mercapto group, sulfide group, disulfide group or sulfonyl group, or a functional group containing 2 or more groups thereof, and the other(s) is/are a hydrogen atom; some Xs in the chemical formula (I) is/are a halogen group, and the other(s) is/are a hydrogen atom; X_1, X_2, X_3, X_4, X_5 and X_6 in the chemical formulas (II) and (III) are each a halogen group or hydrogen atom, unless all of X_1, X_2, X_3, X_4, X_5 and X_6 are each a halogen group; k in the chemical formula (I) is an integer of 1 to 5; m in the chemical formula (II) and (III) is an integer of 2 or more, and m+n is an integer of 3 to 7.

24. (Currently amended) The method for producing a polyacene compound according to claim 22 ~~or 23~~, wherein R_3 and R_4 are each hydrogen atom.

25. (Currently amended) The method for producing a polyacene compound according to claim 22 ~~or 23~~, wherein at least one of the combinations (R_1 and R_2) and (R_3 and R_4) forms a cyclic structure, after R_1 and R_2 or R_3 and R_4 are bound to each other.

26. (Currently amended) The method for producing a polyacene compound according to claim 22 ~~or 23~~, wherein R_1, R_2, R_3 and R_4 have a 1 to 15 carbon atoms, when they are functional groups.

27. (Currently amended) The method for producing a polyacene compound according to claim 22 ~~or 23~~, wherein R_1, R_2, R_3 and R_4 have 2 to 15 carbon atoms, when they are functional groups.

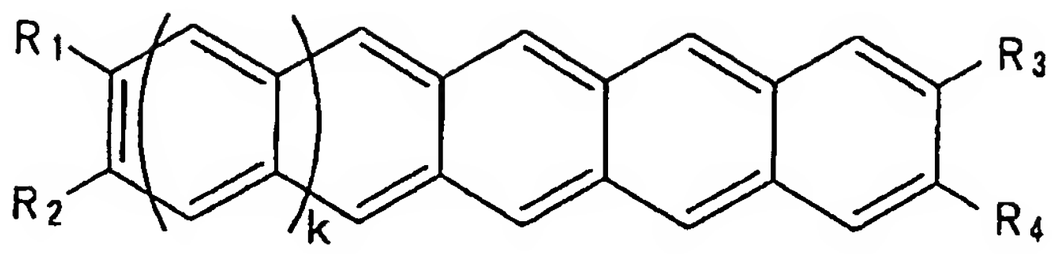
28. (Currently amended) The method for producing a polyacene compound according to claim 22 ~~or 23~~, wherein R_1, R_2, R_3 and R_4 have 2 to 6 carbon atoms, when they are functional groups.

29. (Currently amended) The method according to claim 22 ~~or 23~~ for producing a polyacene compound, wherein an even number of Xs are each a halogen group, at least two of which are bound to the same acene ring.

30. (Currently amended) The method for producing a polyacene compound according to claim 22 ~~or 23~~, wherein two of Xs are each a halogen group and bound to the same acene ring.

31. (Currently amended) The method according to claim 22 ~~or 23~~ for producing a polyacene compound, wherein k is 1 or 2.

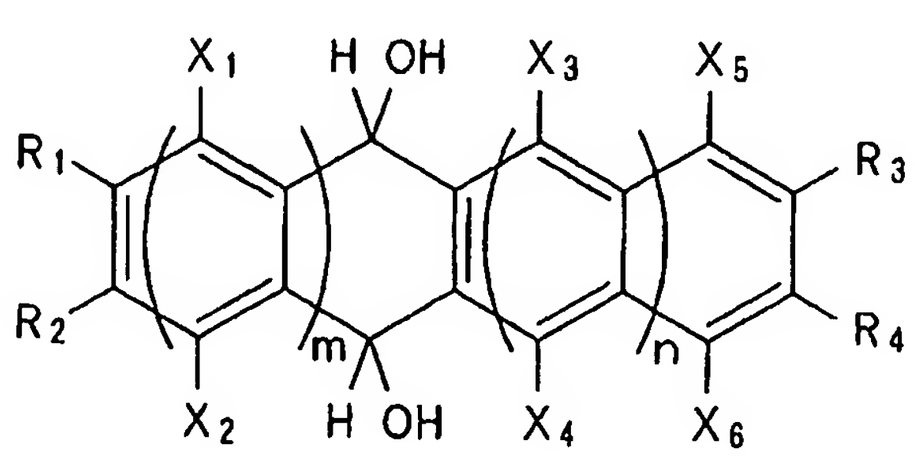
32. (Previously presented) A hydroxypolyacene derivative having a chemical structure corresponding to that of the polyacene, represented by the chemical formula (IV), having the same number of 6-membered rings and the same R_1, R_2, R_3 and R_4, and having at least one carbon atom, except for the one to which R_1, R_2, R_3 or R_4 will be bound when it is converted into the polyacene, bound to a hydroxyl group or hydrogen atom,



(IV)

wherein at least one of R_1, R_2, R_3 and R_4 in the chemical formula (IV) is/are an aliphatic hydrocarbon group (such as an alkyl group, alkenyl group or alkynyl group), aryl group, alkoxy group, aryloxy group, acyl group, ester group, alkyloxycarbonyl group, aryloxycarbonyl group, carboxyl group, formyl group, hydroxyl group, halogen group, amino group, imino group, amide group, cyano group, silyl group, mercapto group, sulfide group, disulfide group or sulfonyl group, or a functional group containing 2 or more groups thereof, and the other(s) is/are a hydrogen atom; and k is an integer of 1 to 5.

33. (Previously presented) A hydroxypolyacene derivative having a chemical structure represented by the chemical formula (III):



(III)

wherein at least one of R_1, R_2, R_3 and R_4 in the chemical formula (III) is/are an aliphatic hydrocarbon group (such as an alkyl group, alkenyl group or alkynyl group), aryl group, alkoxy

group, aryloxy group, acyl group, ester group, alkyloxycarbonyl group, aryloxycarbonyl group, carboxyl group, formyl group, hydroxyl group, halogen group, amino group, imino group, amide group, cyano group, silyl group, mercapto group, sulfide group, disulfide group or sulfonyl group, or a functional group containing 2 or more groups thereof, and the other(s) is/are a hydrogen atom; X_1, X_2, X_3, X_4, X_5 and X_6 in the chemical formula (III) are each a halogen group or hydrogen atom, unless all of X_1, X_2, X_3, X_4, X_5 and X_6 are each a halogen group; and m is an integer of 2 or more, and m+n is an integer of 3 to 7.

34. (Previously presented) A display device provided with pixel planes each composed of a number of pixels, wherein each of the pixels is provided with the organic semiconductor device according to claim 20 or transistor according to claim 21.

35. (Previously presented) The display device according to claim 34, wherein an electrode, dielectric layer and semiconductor layer are formed in the organic semiconductor device or transistor by printing or coating a liquid.